

Conference Abstract

Towards an Ecological Trait-data Standard Vocabulary

Florian D. Schneider[‡], David Fichtmüller[§], Martin M. Gossner^l, Anton Güntsch[¶], Malte Jochum[#], Birgitta Koenig-Ries[□], Gaëtane Le Provost[«], Pete Manning[«], Andreas Ostrowski[□], Caterina Penone[»], Nadja K. Simons^{^, v}

[‡] Unaffiliated, Darmstadt, Germany

[§] Botanic Garden and Botanical Museum Berlin, Freie Universität Berlin, Berlin, Germany

^l Forest Entomology, Swiss Federal Research Institute WSL, Birmensdorf, Switzerland

[¶] Freie Universität Berlin, Berlin, Germany

[#] German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Leipzig, Germany

[□] Department of Mathematics and Computer Science, Friedrich-Schiller-Universität Jena, Jena, Germany

[«] Senckenberg Biodiversity and Climate Research Centre (BiK-F), Frankfurt, Germany

[»] Institute of Plant Sciences, University of Bern, Bern, Switzerland

[^] Department of Biology, Technische Universität Darmstadt, Darmstadt, Germany

^v Department of Ecology and Ecosystem Management, Technische Universität München, Freising, Germany

Corresponding author: Florian D. Schneider (florian.dirk.schneider@gmail.com)

Received: 22 Jun 2019 | Published: 02 Jul 2019

Citation: Schneider F, Fichtmüller D, Gossner M, Güntsch A, Jochum M, Koenig-Ries B, Le Provost G, Manning P, Ostrowski A, Penone C, Simons N (2019) Towards an Ecological Trait-data Standard Vocabulary. Biodiversity Information Science and Standards 3: e37612. <https://doi.org/10.3897/biss.3.37612>

Abstract

Trait-based research spans from evolutionary studies of individual-level properties to global patterns of biodiversity and ecosystem functioning. An increasing number of trait data is available for many different organism groups, published as open access data on a variety of file hosting services. Thus, standardization between datasets is generally lacking due to heterogeneous data formats and types. The compilation of these published data into centralised databases remains a difficult and time-consuming task.

We reviewed existing trait databases and online services, as well as initiatives for trait data standardization. Together with data providers and users participating in a large long-term observation project on multiple taxa and research questions (the Biodiversity Exploratories, www.biodiversity-exploratories.de), we identified a need for a minimal trait-data terminology

that is flexible enough to include traits from all types of organisms but simple enough to be adopted by different research communities.

In order to facilitate reproducibility of analyses, the reuse of data and the combination of datasets from multiple sources, we propose a standardized vocabulary for trait data, the Ecological Trait-data Standard Vocabulary (ETS, hosted on GFBio Terminology Service, <https://terminologies.gfbio.org/terms/ets/pages>), which builds upon and is compatible with existing ontologies. By relying on unambiguous identifiers, the proposed minimal vocabulary for trait data captures the different degrees of resolution and measurement detail for multiple use cases of trait-based research. It further encourages the use of global Uniform Resource Identifiers (URI) for taxa and trait definitions, methods and units, thereby readying the data publication for the semantic web. An accompanying R-package ([traitdata form](#)) facilitates the upload of data to hosting services but also simplifies the access to published trait data.

While originating from a current need in ecological research, in the next step, the described products are being developed for a seamless fit with broader initiatives on biodiversity data standardisation to foster a better linkage of ecological trait data and global e-infrastructures for biological data. The ETS is maintained and discussion on terms are managed via Github (<https://github.com/EcologicalTraitData/ETS>).

Keywords

trait data, data standard, Open Traits, terminology, semantic web

Presenting author

Florian D. Schneider

Presented at

Biodiversity_Next 2019